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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,533	02/27/2002	Hiroshi Hashimoto	020244	6400

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EXAMINER

LE, THAO X

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,533

Applicant(s)

HASHIMOTO ET AL.

Examiner

Thao X Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) 16-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 9-15 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. A diffusion region formed on each of side of the first gate electrode in the first active region is not disclosed in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

Art Unit: 2814

international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5, 7 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6544845 to Yoo et al.

Regarding to claims 1, Yoo discloses a semiconductor integrated circuit (IC) device fig. 12, comprising: a substrate 500, a nonvolatile memory device (flash memory cell), formed in a memory cell region fig. 13 (a), of substrate 500 and having a multilayer gate electrode 502A/504A/506A/508A structure comprising a tunnel insulating film 502A, covering substrate and floating gate electrode 504A, column 8 line 13, formed on the tunnel insulating film 502A and having a side wall surfaces covered with a protection insulating film formed of an oxide 562, column 9 line 30; and a semiconductor device, fig. 13 (b), formed in a device region of substrate 500, the semiconductor device comprising a gate insulating film 503A, column 8 line 48, covering substrate 500 and gate electrode 508B, column 8 line 47, formed on the gate insulating film 503B, wherein a bird's beak structure 518, column 4 line 25-34 and column 9 line 10, is formed of oxide film at an interface of the tunnel insulating film 502A and the floating gate electrode 504A, the bird's beak structure penetrating into the floating gate electrode 504A along the interface from the sidewall faces of the floating gate electrode 504A, and wherein the gate insulating film 503A is interposed between substrate 500 and the gate electrode 508B have a substantially uniform thickness, fig. 13 (b) column 4 lines 40-45.

The process limitations "the thermal" in claim 1, does not carry weight in a claim drawn to structure. In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985).

Regarding to claims 2-5, Yoo discloses the IC device wherein the multiplayer gate electrode structure further comprises an insulating film 506A, column 8 lines 13, formed on the

Art Unit: 2814

floating gate electrode 504A and a control gate electrode 508A, column 8 line 13, formed on the insulated film 506A, wherein each of the gate electrode and control gate electrode comprises doped polysilicon, wherein the oxide film forming the protection insulating film connects to the bird's beak structure, wherein the protection insulating film continuously covers sidewall faces and a top surface of the multilayer gate electrode structure, column 9 line 25-32.

Regarding to claims 7, Yoo discloses the IC device having the tunnel oxide 502A, column 7 line 59.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6544845 to Yoo in view of US 6436765 to Lion et al.

Art Unit: 2814

Regarding to claim 6, Yoo does not expressly disclose the substrate comprises SOI.

However, Lion reference discloses the substrate of a memory device can be Si or SOI, column 2 line 57. At the time of the invention was made; it would have been obvious to one of ordinary skill in the art to use SOI as a substrate, because such silicon substrate or SOI substrate would have been considered a mere substitution of art-recognized equivalent values.

9. Claim 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6544845 to Yoo in view of Applicant Admitted Prior Art (APA).

Regarding to claim 8, Yoo does not expressly disclose the tunnel insulating film is nitride.

However, APA discloses the tunnel oxide 12A or nitride 12B, page 5. At the time of the invention was made; it would have been obvious to one of ordinary skill in the art to replace the tunnel oxide teaching of APA with Yoo, because such material substitution would have been considered a mere substitution of art-recognized equivalent values.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is 703-306-0208. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Application/Control Number: 10/083,533

Page 6

Art Unit: 2814

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Thao X. Le
June 12, 2003



PHAT X. CAO
PRIMARY EXAMINER